In re Patent Application of:
AMMAR
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In the Claims:

1. (CURRENTLY AMENDED) A self-tuned millimeter wave transceiver module comprising:

a microwave monolithic integrated circuit (MMIC) having at least one amplifier; and

a controller comprising a memory that includes stored values of preset MMIC characteristics at various stages in a radio frequency circuit and operatively connected to said MMIC for sensing amplifier operating conditions and tuning the at least one amplifier to an optimum operating condition based on the stored values.

2. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 1, wherein said controller comprises a surface mounted microcontroller chip operatively connected to said MMIC.

3. (CANCELLED)

4. (CURRENTLY AMENDED) A self-tuned millimeter wave transceiver module according to Claim 1 ~~Claim 3~~, wherein said memory comprises an EEPROM.

5. (CURRENTLY AMENDED) A self-tuned millimeter wave transceiver module according to Claim 1 ~~Claim 3~~, wherein said stored values comprise ~~of optimum operating conditions comprise stored values of preset MMIC characteristics, including~~ optimum drain current and expected amplifier output ~~at various stages in a radio frequency circuit~~.

6. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 1, wherein said controller further comprises a sensor for sensing changes in operating amplifier conditions by the at least one amplifier, wherein said controller adjusts the at least one amplifier based on sensed changes in amplifier operating conditions.

7. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 6, and further comprising a digital potentiometer operatively connected to said at least one amplifier for stepping gate voltage within the at least one amplifier based on sensed changes in amplifier operating conditions.

8. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 6, and further comprising a multi-channel analog-to-digital converter operatively connected to said sensor for digitizing sensor output to be compared with stored values of optimum operating conditions.

9. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 1, and further comprising a temperature sensor for measuring the temperature of said MMIC, wherein said controller is responsive to sensed temperature for determining whether any change in amplifier operating conditions is a result of a changed temperature or a malfunction.

10. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 1, and further comprising a power sensor diode operatively connected to said at least one amplifier, wherein said controller is responsive to said power sensor diode for tuning said at least one amplifier.

11. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 1, wherein said controller is operative for correcting one of at least (a) gain variation over temperature; (b) linearization of the power monitor circuit as a function of temperature and frequency; (c) gain equalization as a function of frequency; and (d) power attenuation linearization as a function of frequency and temperature.

12. (CURRENTLY AMENDED) A self-tuned millimeter wave transceiver module comprising:

a microwave monolithic integrated circuit (MMIC) having a plurality of amplifiers, each having a respective source, drain and gate;

a controller operatively connected to said MMIC and each of said amplifiers, said controller including a memory having stored values of optimum operating conditions for an amplifier, <u>including stored values of preset MMIC characteristics at various stages in a radio frequency circuit,</u> wherein said controller is operative for sensing operating conditions and tuning each amplifier to an optimized operating condition based on the stored values.

13. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 12, wherein said controller further comprises at least one sensor for sensing amplifier operating conditions for said amplifiers within said MMIC, a multi-channel, analog-to-digital converter operatively connected to said sensor that digitizes sensor output, and a microprocessor operatively connected to said analog-to-digital converter for comparing any digitized output with stored values within said memory and controlling the tuning of said amplifiers.

14. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 12, wherein said controller comprises a surface mounted microcontroller chip operatively connected to said MMIC.

15. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 12, wherein said memory comprises an EEPROM.

16. (CURRENTLY AMENDED) A self-tuned millimeter wave transceiver module according to Claim 12, wherein said stored values of optimum operating conditions comprise ~~stored values of preset MMIC characteristics, including~~ optimum drain current and expected amplifier output ~~at various stages in a radio frequency circuit~~.

17. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 12, wherein said controller further comprises at least one sensor for measuring changes in current drawn by the amplifiers, wherein said controller adjusts the

amplifiers based on changes in current and the stored values for optimum operating conditions.

18. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 12, and further comprising a digital potentiometer operatively connected to the amplifiers for stepping gate voltage within the amplifiers based sensed operating conditions each amplifier.

19. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 12, wherein said controller further comprises a multi-channel, analog-to-digital converter that digitizes sensed operating conditions to be compared with stored values of optimum operating conditions.

20. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 12, and further comprising a temperature sensor for measuring the temperature of said MMIC, wherein said controller is responsive to sensed temperature for determining whether any change in amplifier current is a result of changed temperature conditions or malfunction.

21. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 12, and further comprising a power sensor diode operatively connected to said at least one amplifier, wherein said controller is responsive to said power sensor diode for tuning said at least one amplifier.

22. (ORIGINAL) A self-tuned millimeter wave transceiver module according to Claim 12, wherein said controller is

operative for correcting one of at least (a) gain variation over temperature; (b) linearization of the power monitor circuit as a function of temperature and frequency; (c) gain equalization as a function of frequency; and (d) power attenuation linearization as a function of frequency and temperature.